

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (currently amended) An induction melting furnace for heating a melt and discharging a metered amount of the melt, the induction melting furnace comprising:

a feed chamber having a sealable supply opening for placing a charge of the melt in the feed chamber and for isolating the interior of the feed chamber from the ambient environment, the feed chamber having a sealable delivery opening;

a melt chamber for heating the melt in the melt chamber, the melt chamber connected directly to the feed chamber by the sealable delivery opening whereby sealing the sealable supply opening of the feed chamber and unsealing the sealable delivery opening of the feed chamber permits the transfer of the charge from the feed chamber to the melt chamber without subjecting the melt in the melt chamber to the ambient environment, the melt chamber having a melt chamber outlet for discharge of the melt;

an at least one induction coil at least partially surrounding the melt chamber;

a meter chamber having a meter chamber inlet and a meter chamber outlet, the meter chamber inlet connected directly to the melt chamber outlet by a connecting passage;

a means for opening and closing the connecting passage to control the flow of the melt through the connecting passage; and

a means for opening and closing the meter chamber outlet, whereby opening the connecting passage while the meter chamber outlet is closed fills the meter chamber with the melt, and opening the meter chamber outlet while the meter chamber is filled with melt and the connecting passage is closed discharges a metered amount of the melt from the meter chamber through the meter chamber outlet.

2. (previously presented) The induction melting furnace of claim 1 wherein a magnetic field created by a flow of an ac current in the at least one induction coil inductively heats the melt chamber whereby the heat induced in the melt chamber heats the melt in the melt chamber by conduction.

3. (previously presented) The induction melting furnace of claim 1 wherein a magnetic field created by a flow of an ac current in the at least one induction coil inductively heats the melt in the melt chamber.

4. (canceled)

5. (currently amended) The induction melting furnace of claim [4] 18 wherein a magnetic field created by a flow of an ac current in the at least one meter chamber induction coil inductively heats the meter chamber whereby the heat induced in the meter chamber heats the melt in the meter chamber by conduction.

6. (currently amended) The induction melting furnace of claim [4] 18 wherein a magnetic field created by a flow of an ac current in the at least one meter chamber induction coil inductively heats the melt in the meter chamber.

7. (canceled)

8. (canceled)

9. (previously presented) The induction melting furnace of claim 1 further comprising a gas system whereby a gas can be selectably supplied to or withdrawn from the feed chamber; selectably supplied to the melt chamber; and selectably supplied to or withdrawn from the meter chamber.

10. (currently amended) A method of heating a melt and discharging a metered amount of the melt, the method comprising the steps of:

- placing the melt in a melt chamber having a melt chamber outlet;
- surrounding the melt chamber at least partially with a one or more induction coils;
- flowing an ac current through the one or more induction coils to inductively heat the melt chamber or the melt in the melt chamber;

- connecting an inlet of a meter chamber directly to the melt chamber outlet by a melt chamber outlet valve;

- connecting an outlet of the meter chamber to a meter chamber outlet ~~value~~ valve;
- closing the meter chamber outlet valve and opening the melt chamber outlet value to fill the meter chamber with melt from the melt chamber; and

- closing the melt chamber outlet valve and opening the meter chamber outlet valve to discharge the metered volume of melt in the meter chamber.

11. (previously presented) The method of claim **10** further comprising the step of selectively flowing the ac current through the one or more induction coils to inductively heat selected regions of the melt chamber or melt in the melt chamber.

12. (currently amended) The method of claim **10** further comprising the step of connecting a tuning capacitor in parallel with one of the one or more induction coils to

form a passive tank circuit and magnetically coupling the induction coil in the passive tank circuit with at least one of the other one or more induction coils having the ac current flow to induce ~~the~~ an induced ac current in the passive tank circuit.

13. (canceled)

14. (canceled)

15. (canceled)

16. (currently amended) The method of claim [15] 20 further comprising injecting the gas withdrawn from the meter chamber into the volume above the melt in the melt chamber.

17. (canceled)

18. (new) An induction melting furnace for heating a melt and discharging a metered amount of the melt, the induction melting furnace comprising:

 a feed chamber having a sealable supply opening for placing a charge of the melt in the feed chamber, the feed chamber having a sealable delivery opening;

 a melt chamber for heating the melt in the melt chamber, the melt chamber connected to the feed chamber by the sealable delivery opening, the melt chamber having a melt chamber outlet for discharge of the melt;

 an at least one induction coil at least partially surrounding the melt chamber;

 a meter chamber having a meter chamber inlet and a meter chamber outlet, the meter chamber inlet connected to the melt chamber outlet by a connecting passage;

 an at least one meter chamber induction coil at least partially surrounding the meter chamber;

 a means for opening and closing the connecting passage to control the flow of the melt through the connecting passage; and

 a means for opening and closing the meter chamber outlet, whereby opening the connecting passage while the meter chamber outlet is closed fills the meter chamber with the melt, and opening the meter chamber outlet while the meter chamber is filled with melt and the connecting passage is closed discharges a metered amount of the melt from the meter chamber through the meter chamber outlet.

19. (new) A method of heating a melt and discharging a metered amount of the melt, the method comprising the steps of:

 placing the melt in a melt chamber having a melt chamber outlet;

surrounding the melt chamber at least partially with a one or more induction coils;
flowing an ac current through the one or more induction coils to inductively heat the melt chamber or the melt in the melt chamber;

connecting an inlet of a meter chamber to the melt chamber outlet by a melt chamber outlet valve;

connecting an outlet of the meter chamber to a meter chamber outlet valve;
closing the meter chamber outlet valve and opening the melt chamber outlet valve to fill the meter chamber with melt from the melt chamber;

surrounding the meter chamber at least partially with an at least one meter chamber induction coil and flowing an ac current through the at least one meter chamber induction coil to inductively heat the meter chamber or the melt in the meter chamber;
and

closing the melt chamber outlet valve and opening the meter chamber outlet valve to discharge the metered volume of melt in the meter chamber.

20. (new) A method of heating a melt and discharging a metered amount of the melt, the method comprising the steps of:

placing the melt in a melt chamber having a melt chamber outlet;
surrounding the melt chamber at least partially with a one or more induction coils;
flowing an ac current through the one or more induction coils to inductively heat the melt chamber or the melt in the melt chamber;

connecting an inlet of a meter chamber to the melt chamber outlet by a melt chamber outlet valve;

connecting an outlet of the meter chamber to a meter chamber outlet valve;
closing the meter chamber outlet valve and opening the melt chamber outlet valve to fill the meter chamber with melt from the melt chamber;

closing the melt chamber outlet valve and opening the meter chamber outlet valve to discharge the metered volume of melt in the meter chamber;

injecting the gas into the meter chamber when the melt chamber outlet valve is closed and the meter chamber outlet valve is opened to displace the metered volume of melt discharging from the meter chamber;

withdrawing the gas from the meter chamber when the melt chamber outlet valve is opened and the meter chamber outlet valve is closed to permit filling of the meter

chamber with melt from the melt chamber;

placing a charge of the melt in a sealable feed chamber, a feed chamber outlet sealable connected to the melt chamber;

sealing the feed chamber;

delivering the charge to the melt chamber through the feed chamber outlet;

injecting a gas into the volume above the melt in the melt chamber;

injecting the gas into the feed chamber to approximately the same pressure of the gas injected into the volume above the melt in the melt chamber before delivering the charge to the melt chamber; and

withdrawing the gas from the feed chamber after delivering the charge to the melt chamber.